Amendment to the Claims:

Please amend the claims as follows:

Please cancel claims 37 to 38, without prejudice or disclaimer.

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (original): A method for isolating and maintaining a cell from a mixed population of uncultivated cells comprising:

(a) encapsulating in a microenvironment at least a single cell from the mixed population;

(b) placing the encapsulated cell in a growth column; and

(c) incubating the encapsulated cell in the growth column under conditions allowing the encapsulated cell to survive and be maintained, thereby isolating and maintaining the cell.

Claim 2 (original): The method of claim 1, wherein the mixed population of uncultivated cells comprises an environmental sample.

Claim 3 (original): The method of claim 2, wherein the environmental sample is selected from the group consisting of: geothermal fields, hydrothermal fields, acidic soils, sulfotara mud pots, boiling mud pots, pools, hot-springs, geysers, marine actinomycetes, metazoan, endosymionts, ectosymbionts, tropical soil, temperate soil, arid soil, compost piles, manure piles, marine sediments, freshwater sediments, water concentrates, hypersaline sea ice, super-cooled sea ice, arctic tundra, Sargosso sea, open ocean pelagic, marine snow, microbial mats, whale falls, springs, hydrothermal vents, insect and nematode gut microbial communities, plant endophytes, epiphytic water samples, industrial sites and *ex situ* enrichments.

Claim 4 (original): The method of claim 2, wherein the environmental sample is selected from the group consisting of: eukaryotes, prokaryotes, myxobacteria (epothilone), air, water, sediment, soil and rock.

Claim 5 (original): The method of claim 1, wherein the mixed population of uncultivated cells comprises a mixture of materials.

Claim 6 (original): The method of claim 5, wherein the mixture of materials comprises a biological sample, soil or sludge.

Claim 7 (original): The method of claim 6, wherein the biological sample comprises a plant sample, a food sample, a gut sample, a salivary sample, a blood sample, a sweat sample, a urine sample, a spinal fluid sample, a tissue sample, a vaginal swab, a stool sample, an amniotic fluid sample or a buccal mouthwash sample.

Claim 8 (original): The method of claim 1, wherein a cell comprises a microorganism.

Claim 9 (original): The method of claim 8, wherein the microorganism comprises a bacterial cell, a yeast cell, an archaeal cell, a plant cell, a mammalian cell, an insect cell or a protozoan cell.

Claim 10 (original): The method of claim 1, wherein the cells comprise extremophiles.

Claim 11 (original): The method of claim 10, wherein the extremophiles are selected from the group consisting of hyperthermophiles, psychrophiles, halophiles, psychrotrophs, alkalophiles, and acidophiles.

Claim 12 (original): The method of claim 1, wherein the cells are encapsulated in a porous gel microdroplet (GMD).

Claim 13 (original): The method of claim 12, wherein the porous gel microdroplet (GMD) comprises a hydrogel matrix or a selectively permeable membrane.

Claim 14 (original): The method of claim 12, wherein the porous gel microdroplet (GMD) comprises a CELMIX™ emulsion matrix or a CELGEL™ encapsulation matrix.

Claim 15 (original): The method of claim 1, wherein one cell is encapsulated in each porous gel microdroplet (GMD).

Claim 16 (original): The method of claim 1, wherein one to four cells is encapsulated in each porous gel microdroplet (GMD).

Claim 17 (original): The method of claim 1, wherein the growth column comprises a capillary.

Claim 18 (original): The method of claim 17, wherein the capillary comprises a capillary array.

Claim 19 (original): The method of claim 18, wherein the capillary array comprises a GIGAMATRIX™.

Claim 20 (original): The method of claim 1, wherein the growth column comprises a chromatography column.

Claim 21 (original): The method of claim 1, wherein conditions allowing the encapsulated cell to survive and be maintained comprise providing nutrients at *in situ* concentrations.

Claim 22 (original): The method of claim 1, wherein conditions allowing the encapsulated cell to survive and be maintained comprise flowing an aqueous nutrient mixture through the growth column.

Claim 23 (original): The method of claim 1, further comprising incubating and culturing the encapsulated cell in the growth column under conditions allowing growth or proliferation of the cells into a microcolony comprising at least two daughter cells.

Claim 24 (original): The method of claim 23, wherein the microcolony comprises between about 4 and 100 cells.

Claim 25 (original): The method of claim 23, further comprising isolating a gel microdroplet.

Claim 26 (original): The method of claim 25, comprising isolating a microcolony from the gel microdroplet.

Claim 27 (original): The method of claim 26, wherein comprising isolating a cell from the microcolony.

Claim 28 (original): The method of claim 25, wherein isolating a gel microdroplet comprises sorting an encapsulated microcolony by size.

Claim 29 (original): The method of claim 28, wherein sorting an encapsulated microcolony by size comprises using flow cytometry.

Claim 30 (original): The method of claim 25, wherein the gel microdroplet is isolated by FACS.

Claim 31 (original): The method of claim 27, further comprising maintaining the isolated cell by re-encapsulating and re-culturing the isolated cell.

Claim 32 (original): The method of claim 31, wherein between about 20 and 100 cells are maintained in each re-encapsulated microcolony.

Claim 33 (original): The method of claim 31, further comprising screening the interactions between encapsulated cells.

Claim 34 (original): The method of claim 25, further comprising re-culturing the isolated gel microdroplet under the same or different conditions.

Claim 35 (original): The method of claim 1, further comprising direct amplification of nucleic acid from the encapsulated cell.

Claim 36 (original): The method of claim 23, further comprising direct amplification of nucleic acid from the cultivated encapsulated cells.

Claims 37 to 38 (canceled)

Claim 39 (new): A method for isolating a cell from a mixed population of uncultivated cells comprising:

(a) encapsulating in a microenvironment at least a single cell from the mixed population;

(b) placing the encapsulated cell in a growth column; and

(c) incubating the encapsulated cell in the growth column under conditions allowing the encapsulated cell to survive, thereby isolating the cell.

Claim 40 (new): A method for maintaining a cell from a mixed population of uncultivated cells comprising:

(a) encapsulating in a microenvironment at least a single cell from the mixed population;

(b) placing the encapsulated cell in a growth column; and

(c) incubating the encapsulated cell in the growth column under conditions allowing the encapsulated cell to survive and be maintained, thereby maintaining the cell.